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(54) Title: APPARATUS FOR DEPLOYING AN AIR BAG THROUGH A HARD PANEL

(57) Abstract

An apparatus for deploying an air bag through an automotive dash panel (12) includes an air bag door (16) integrally formed in the panel and defined by a door perimeter including a frangible edge (18) of reduced cross section. A dispenser (20) supports the air bag (24) behind the door. A metal reaction plate (28) is positioned between the air bag (24) and the door (16). When the air bag inflates, it forces the reaction plate (28) to bend around a horizontal hinge line (36). As the reaction plate pivots it concentrates inflation force along a lower portion of the frangible door edge. This helps to predictably separate the door from the dash panel by tearing along the lower door edge and allowing the tear to propagate up two side edges. In one embodiment, the tear also propagates across an upper edge to completely separate the door from the panel. At least one, and preferably two or three tethers (50) limit how far the door can travel during air bag inflation. A stop member may be included to limit reaction plate bending. After deployment, the reaction plate remains in a position that prevents the door from returning to its original position. A retaining structure may be included to preclude at least a portion of the air bag door from tearing free of the vehicle panel. A hinge (44) may be embedded in the panel in a position spanning a portion of the door perimeter. A hollow channel may be formed into the panel along the frangible marginal edge to create a substantial strength differential with the door perimeter to promote bending along the hinge and/or to help confine tearing to the frangible marginal edge during air bag deployment.

